Risk Assessment Procedures/Considerations

- Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

- Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Checklist for Question B

	Checklist for Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?
Changes in Standards and TBCs *Discuss the following:*	
	Whether standards identified in the ROD have been revised and call into question the protectiveness of the remedy
	Whether newly promulgated standards call into question the protectiveness of the remedy
	Whether TBCs used in selecting cleanup levels at the site have changed and could affect the protectiveness of the remedy
Changes in Exposure Pathways *Discuss the following:*	
	Whether land use or expected land use on or near the site changed
	Whether human health or ecological routes of exposure or receptors have been newly identified or changed in a way that could affect the protectiveness of the remedy
	Whether there are newly identified contaminants or contaminant sources
	Whether there are unanticipated toxic byproducts of the remedy not previously addressed by the decision documents
	Whether physical site conditions or the understanding of these conditions have changed in a way that could affect the protectiveness of the remedy
Changes in Toxicity and Other Contaminant Characteristics *Discuss the following:*	
	Whether toxicity factors for contaminants of concern at the site have changed in a way that could affect the protectiveness of the remedy
	Whether other contaminant characteristics have changed in a way that could affect the protectiveness of the remedy
Changes in Risk Assessment Methods *Discuss the following:*	
	Whether standardized risk assessment methodologies have changed in a way that could affect the protectiveness of the remedy
Expected Progress Towards Meeting RAOs	
	Whether the remedy is progressing as expected

Checklist for Question C

	Checklist for Question C: Has any other information come to light that could call into question the protectiveness of the remedy?
Other Information *Discuss the following:*	
	Whether newly identified ecological risks been found
	Whether there are impacts from natural disasters
	Whether any other information has come to light which could affect the protectiveness of the remedy

Answering Question B

- Evaluate the effects of significant changes in standards and assumptions that were used at the time of remedy selection
  - Changes in standards and TBCs
  - Changes in exposure pathways
  - Changes in toxicity or other contaminant characteristics
- Focus on the COCs
- Evaluate the RAOs

Impact of Changes in Standards and TBCs

- Focus on
  - Changes in standards identified as ARARs
  - Newly promulgated standards
  - Changes in TBCs
- Determine the basis for the cleanup levels
  - ARARs (e.g., MCLs)
  - Risk-based (e.g., calculated site-specific risk)
- Do the changes affect the protectiveness of the remedy?

Impact of Changes in Exposure Pathways

- Consider
  - Changes in current or anticipated land use on or near the site
  - New receptors or exposure pathways (e.g., vapor intrusion)
  - Newly identified contaminants or sources
  - Changes in physical site conditions
- Do the changes affect the protectiveness of the remedy?

Impact of Changes in Toxicity and Other Contaminant Characteristics

- Look for
  - Changes in toxicity values (e.g., IRIS)
  - Changes in other contaminant characteristics (e.g., mobility, bioavailability)
  - Unanticipated toxic byproducts of the remedy
  - Changes in the calculated risk
- Consider both human and eco receptors
- Do the changes affect the protectiveness of the remedy?

Example Tables

- Use tables to record changes

COC	Frequency of Detection	Units	Maximum Detected Concentration	MCL		PRG	
				Previous	Current		
TCE	6/25	ug/L	84000	5	5	0.028	ca
1,2-DCE	4/25	ug/L	1200	70	70	61	nc
Vinyl Chloride	1/25	ug/L	26	2	2	0.02	ca
Manganese	20/24	ug/L	3600	200	50	880	nc

COC	Toxicity Values							
	RfDo (mg/kg-day)		SFo 1/(mg/kg-day)		RfDi (mg/kg-day)		SFi 1/(mg/kg-day)	
	Previous	Current	Previous	Current	Previous	Current	Previous	Current
TCE	6.0E-03	--	1.1E-02	1.3E-02	--	1.7E-01	1.7E-02	7.0E-03
1,2-DCE	1.0E-02	1.0E-02	--	--	--	1.0E-02	--	--
Vinyl Chloride	--	3.0E-03	1.9E+00	1.5E+00	--	2.9E-02	3.0E-01	3.1E-02
Manganese	5.0E-03	1.4E-01	--	--	1.14E-04	1.4E-05	--	--

Vapor Intrusion – What is it?

- Vapor Intrusion is the migration of volatile chemicals from the subsurface into overlying buildings. Volatile chemicals in buried wastes and/or contaminated groundwater can emit vapors that may migrate through subsurface soils and into indoor air spaces of overlying buildings.

Vapor Intrusion – When should it be considered in the five-year review?

- At any site where buildings are or may be constructed over VOC contaminated groundwater or soil
- If not addressed in the ROD or DD
- If not evaluated as a potential exposure pathway in the risk assessment
  - Could potential vapor intrusion impacts affect the protectiveness of the remedy?
  - Report evaluation results in Question B

Answering Question C

- Eco Risk
  - Have ecological risks been adequately addressed at the site?
  - If not, is there a plan to address them through a future action?
- Other Factors
  - Weather-related events (e.g., earthquakes)
  - Any other new information or guidance that might be relevant to the protectiveness of the remedy

Questions?

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